CLAIMS

We claim:

1.   1.   A disambiguation method in a spoken dialog service that identifies a user need,

2.   the disambiguation method being associated with a rooted tree, the method comprising:

3.   (a)   based on a received user utterance in response to a prompt, establishing

4.   at least one lit node and assigning a current focus node;

5.   (b)   if there is a single direct descendent of the focus node that is lit:

6.   (1)   assigning the lit direct descendent of the current focus node as a

7.   new focus node;

8.   (2)   if the new focus node is a leaf node, identifying the user need; and

9.   (3)   if the new focus node is not a leaf node, prompting the user to

10.   disambiguate between descendent nodes of the new focus node and returning to step (a);

11.   (c)   if there is not a single direct descendent of the current focus node that is

12.   lit:

13.   (1)   assigning a lowest common ancestor node of all lit nodes as a new

14.   focus node;

15.   (2)   prompting the user for input to disambiguate between descendent

16.   nodes of the new focus node; and

17.   (3)   returning to step (a).

1.   2.   The method of claim 1, wherein if after step (a), only one lit node exists that is

2.   not a direct descendent of the focus node, and the one lit node is a leaf node, the method

3.   further comprises:

4.   (d) identifying the user need according to the lit leaf node.

1   3.   The method of claim 2, wherein if only one lit node exists that is not a direct

2   descendent of the focus node and the one lit node is a leaf node, the method further

3   comprises presenting information to the user regarding a condition of the lit leaf node.

1   4.   The method of claim 1, wherein a first prompt to the user is associated with a

2   root node of a rooted tree.

1   5.   A dialog manager within a spoken dialog service, the dialog manager operating

2   according to a dialog disambiguation rooted tree, the rooted tree having a root node,

3   nodes descending from the root nodes organized in categories and leaf nodes, the dialog

4   manager performing the steps:

5   (a)   gathering input from a user to match with at least one node and node

6   condition, wherein a first prompt from the dialog manager relates to a focus root node;

7   (b)   lighting at least one relevant node according to the received user input;

8   (c)   generalizing by attempting to select a new focus node further from a

9   current focus node by:

10   (1)   assigning a node as a new focus node if it is the only lit direct

11   descendent of a focus node after step (b); and

12   (2)   assigning a lowest common ancestor node as a new focus node if

13   there are multiple descendent nodes that are lit and step (c)(1) does not apply.

1   6.   The dialog manager of claim 5, wherein step (c)(1) further comprises:

2   if the new focus node is a leaf node, identifying the user need; and

3   if the new focus nodes is not a leaf node, prompting the user to disambiguate

4   between descendent nodes of the new focus node and returning to step (b).

1   7.   The dialog manager of claim 6, wherein step (c)(2) further comprises:

2   prompting the user for input to disambiguate between descendent nodes of the

3   new focus node; and

4   returning to step (b).

1   8.   The dialog manager of claim 5, wherein if after step (b), only one lit node exists

2   that is not a direct descendent of the focus node, and the one lit node is a leaf node, the

3   method further comprises:

4   identifying the user need according to the lit leaf node.

1   9.   The dialog manager of claim 8, wherein if only one lit node exists that is not a

2   direct descendent of the focus node and the one lit node is a leaf node, the method

3   further comprises presenting information to the user regarding a condition of the lit leaf

4   node.

1   10.   A method within a spoken dialog service for controlling a dialog flow using a

2   dialog disambiguation rooted tree, the rooted tree having a root node, nodes descending

3   from the root nodes organized in categories and leaf nodes, the method comprising:

4   (a)   gathering input from a user to match with at least one node and node

5   condition, wherein a first prompt from the dialog manager relates to a focus root node;

6   (b)   lighting at least one relevant node according to the received user input;

7   (c)   generalizing by attempting to select a new focus node further from a

8   current focus node by:

9   (1)   assigning a node as a new focus node if it is the only lit direct

10 descendent of a focus node after step (b); and

11   (2)   assigning a lowest common ancestor node as a new focus node if

12 there are multiple descendent nodes that are lit and step (c)(1) does not apply.

1   11.   The method of claim 10, wherein step (c)(1) further comprises:

2   if the new focus node is a leaf node, identifying the user need; and

3   if the new focus node is not a leaf node, prompting the user to disambiguate

4 between descendent nodes of the new focus node and returning to step (b).

1   12.   The method of claim 10, wherein if after step (b), only one lit node exists that is

2 not a direct descendent of the focus node, and the one lit node is a leaf node, the method

3 further comprises:

4   identifying the user need according to the lit leaf node.

1   13.   The method of claim 12, wherein if only one lit node exists that is not a direct

2 descendent of the focus node and the one lit node is a leaf node, the method further

3 comprises presenting information to the user regarding a condition of the lit leaf node.

1   14.   A spoken dialog service utilizing a disambiguation method associated with a

2 rooted tree, the disambiguation method:

3   (a)   based on a received user utterance in response to a prompt, establishing

4 at least one lit node and assigning a current focus node;

5   (b)   if there is a single direct descendent of the focus node that is lit:

6   (1)   assigning the lit direct descendent of the current focus node as a

7 new focus node;

8   (2)   if the new focus node is a leaf node, identifying the user need; and

9   (3)   if the new focus node is not a leaf node, prompting the user to

10 disambiguate between descendent nodes of the new focus node and returning to step (a);

11   (c)   if there is not a single direct descendent of the current focus node that is

12 lit:

13   (1)   assigning a lowest common ancestor node of all lit nodes as a new

14 focus node;

15   (2)   prompting the user for input to disambiguate between descendent

16   nodes of the new focus node; and

17   (3)   returning to step (a).

1   15.   The spoken dialog service of claim 14, wherein if after step (a), only one lit node

2   exists that is not a direct descendent of the focus node, and the one lit node is a leaf

3   node, the method further comprises:

4   (d) identifying the user need according to the lit leaf node.

1   16.   The spoken dialog service of claim 15, wherein if only one lit node exists that is

2   not a direct descendent of the focus node and the one lit node is a leaf node, the method

3   further comprises presenting information to the user regarding a condition of the lit leaf

4   node.

1   17.   The spoken dialog service of claim 15, wherein a first prompt to the user is

2   associated with a root node of a rooted tree.

1   18.   A computer-readable medium storing computer readable instructions for

2   instructing a computing device to perform a disambiguation method in a spoken dialog

3   service that identifies user need, the disambiguation method being associated with a

4   rooted tree, the method comprising:

5   (a)   based on a received user utterance in response to a prompt, establishing

6   at least one lit node and assigning a current focus node;

7   (b)   if there is a single direct descendent of the focus node that is lit:

8   (1)   assigning the lit direct descendent of the current focus node as a

9   new focus node;

10   (2)   if the new focus node is a leaf node, identifying the user need; and

11   (3)   if the new focus node is not a leaf node, prompting the user to

12   disambiguate between descendent nodes of the new focus node and returning to step (a);

13   (c)   if there is not a single direct descendent of the current focus node that is

14   lit:

15   (1)   assigning a lowest common ancestor node of all lit nodes as a new

16   focus node;

17   (2)   prompting the user for input to disambiguate between descendent

18   nodes of the new focus node; and

19   (3)   returning to step (a).

1   19.   The computer-readable medium of claim 18, wherein if after step (a), only one lit

2   node exists that is not a direct descendent of the focus node, and the one lit node is a leaf

3   node, the method further comprises:

4   (d) identifying the user need according to the lit leaf node.

1   20.   The computer-readable medium of claim 19, wherein if only one lit node exists

2   that is not a direct descendent of the focus node and the one lit node is a leaf node, the

3   method further comprises presenting information to the user regarding a condition of

4   the lit leaf node.

1   21.   The computer-readable medium of claim 18, wherein a first prompt to the user is

2   associated with a root node of the rooted tree.